

## **CLAIMS:**

What is claimed is:

1. An electrical connector, comprising:

a housing having a front mating end, a rear terminating end and at least one terminal-receiving passage extending in a direction defining an insertion axis extending between said ends, the passage having a rear open end communicating with the rear terminating end of the housing;

a TPA device engageable with the housing at said front mating end thereof in a pre-load position and including a through passage communicating with the terminal-receiving passage in the housing, the TPA device being movable rearwardly from said pre-load position to a locking position;

a terminal insertable through the rear terminating end of the housing into the rear open end of the terminal-receiving passage along said insertion axis and into the through passage in the TPA device for conjoint movement with the TPA device from said pre-load position to said locking position;

terminal locking means including a locking surface on the housing at said terminal-receiving passage and engageable with a locking shoulder on the terminal; and

complementary interengaging ramp means between the TPA device and the housing and extending at an angle to said axis for moving the locking shoulder of the terminal transversely of said axis onto the locking surface on the housing as the TPA device and the terminal move conjointly from said pre-load position to said locking position angularly of said axis.

2. The electrical connector of claim 1 wherein said ramp means comprise a ramp surface on the TPA device engageable with a ramp surface on the housing, the ramp surfaces extending at an angle to said axis.

3. The electrical connector of claim 2 wherein said TPA device includes a detent portion having said ramp surface on an outside thereof, with an inside of the detent portion having detent means thereon engageable with detent means on the housing for holding the TPA device in said pre-load and locking positions.

4. The electrical connector of claim 3 wherein said detent portion is located at one side of the TPA device, and including a locking arm on an opposite side of the TPA device, the locking arm being engageable with a locking shoulder on the terminal.

5 5. The electrical connector of claim 1, including a plurality of said terminal-receiving passages in the housing aligned with a plurality of said through passages in the TPA device for receiving a plurality of said terminals in at least one row thereof, a plurality of locking arms on the TPA device respectively engageable with locking shoulders on the terminals, and a plurality of ramp arms on the TPA device and having said ramp means thereon.

6. The electrical connector of claim 5 wherein said ramp means comprise ramp surfaces on the outside of the ramp arms engageable with ramp surfaces on the housing, the ramp surfaces extending at an angle to said insertion axis.

7. The electrical connector of claim 6 wherein said ramp arms are located in a row at one side of the TPA device, and said locking arms are located in a row at an opposite side of the TPA device, the locking arms being aligned between the ramp arms.

8. The electrical connector of claim 7 wherein said ramp arms having said ramp surfaces on an outside thereof and detent means on an inside thereof, the detent means being engageable with complementary detent means on the housing for holding the TPA device in said pre-load and locking positions.

9. The electrical connector of claim 8 wherein said detent means comprise at least one chamfered detent boss on one of the housing or detent arms engageable in detent recesses in the other of the housing or detent arms.

10. The electrical connector of claim 8 wherein said housing has a row of detent arms aligned with said ramp arms on the TPA device and having said complementary detent means thereon.

11. An electrical connector, comprising:
- a housing having a front mating end, a rear terminating end and at least one terminal-receiving passage extending in an insertion direction between the ends, the passage having a rear open end communicating with the rear terminating end of the housing;
- 5 a terminal insertable into the rear open end of the passage from the rear terminating end of the housing;
- a TPA device engageable with the housing;
- primary terminal locking means including a primary locking arm on the TPA device engageable with a locking shoulder on the terminal; and
- 10 secondary terminal locking means including a secondary locking surface on the housing engageable with said locking shoulder on the terminal,
- whereby said single locking shoulder on the terminal performs a dual function of being part of both said primary terminal locking means and said secondary terminal locking means.
12. The electrical connector of claim 11 wherein said locking shoulder on the terminal extends transversely of the insertion direction of the terminal, said primary locking arm on the TPA device being engageable with the locking shoulder generally at the center thereof, and the housing has a pair of said secondary locking surfaces engageable with the
- 5 locking shoulder at opposite sides of the primary locking arm.

13. An electrical connector, comprising:

a housing having a front mating end, a rear terminating end and at least one terminal-receiving passage extending in an insertion direction between the ends, the passage having a rear open end communicating with the rear terminating end of the housing, and the front

5 mating end of the housing having an open receptacle area;

a TPA device engageable with the housing at said front mating end thereof in a pre-load position whereat a substantial portion of the TPA device projects outside the housing beyond the front mating end thereof, the TPA device having a through passage coincident with the terminal-receiving passage in the housing and including a primary locking arm

10 which is flexible outside the housing generally transversely of said insertion direction and having a primary lock portion exposed in the through passage; and

a terminal insertable through the rear terminating end of the housing into the rear open end of the terminal-receiving passage and into the through passage in the TPA device, the terminal having a primary lock portion engageable by the primary lock portion of the primary  
15 locking arm of the TPA device, the TPA device and the terminal being movable conjointly rearwardly from said pre-load position to a locking position of the TPA device in the open receptacle area at the front mating end of the housing which defines an inserted mating position of the terminal.

14. The electrical connector of claim 13 wherein said housing includes a secondary locking surface engageable with a secondary locking shoulder on the terminal.

15. The electrical connector of claim 14 wherein said primary lock portion on the terminal and said secondary locking shoulder on the terminal comprise portions of a single transverse locking shoulder on the terminal.

16. The electrical connector of claim 15 wherein said locking shoulder on the terminal extends transversely of the insertion direction of the terminal, said primary lock portion of the primary locking arm on the TPA device being engageable with the locking shoulder generally at the center thereof, and the housing has a pair of said secondary locking  
5 surfaces engageable with the locking shoulder at opposite sides of the primary locking arm.